

## Contributions to the Natural History of Christmas Island, in the Indian Ocean

The collections and field notes on which the articles in this Bulletin are based were made on Christmas Island between September 1938 and November 1940. They represent the leisure of a medical officer, and were only made possible by the permission and co-operation of the Christmas Island Phosphate Company. The articles themselves were prepared in 1940 and 1941, with the collaboration of the staff of the Raffles Museum and several specialists working in association with it.

The collections originally covered all the terrestrial fauna, the marine crustacea and the echinodermata. Unfortunately it was not possible to dispatch many of the specimens, including the majority of the insects, to the various specialists, and they were still in the Kuala Lumpur Museum, unexamined, at the time of the Japanese invasion. It seems probable that they were destroyed when the museum was bombed in 1945, and these papers are printed here as all that is now likely to arise from the work. In two cases they are incomplete: H. M. Pendlebury had intended writing a further report on the moths, covering the microlepidoptera, and certain sections of the paper on the birds were lost during the Japanese occupation.

Christmas Island lies in the eastern part of the Indian Ocean, between latitudes  $10^{\circ} 25'$  and  $10^{\circ} 34'$  south, and longitudes  $105^{\circ} 34'$  and  $105^{\circ} 46'$  east. It is about 180 miles south of Java Head, and 530 miles east of the Cocos-Keeling Islands. Its existence was first reported by a homeward bound merchantman, which sighted it on Christmas Day, 1643. The earliest descriptive account occurs in Dampier's *Voyages*, and includes a reference to the presence of boobies, frigate-birds and robber-crabs. It was well known to navigators during the next two hundred years, and a number of landings were made. Such accounts as were published, however, contributed little to the knowledge of the island, and several eighteenth century writers referred to wild pigs, coconut palms and lime-trees, none of which really existed.

In January, 1887, a number of men were landed from the surveying vessel *Flying Fish* at the inlet now known as Flying Fish Cove. They made a small collection of plants and animals, but they did not attempt any serious exploration as the island seemed of little value. Nine months later H.M.S. *Egeria* put in at Christmas Island and remained for about ten days. During her stay J. J. Lister made much more extensive collections on the shore terrace in the neighbourhood of Flying Fish Cove, and

#### INTRODUCTORY NOTE

a small party cut its way to the summit and obtained a number of rock specimens from various areas.

The island was formally annexed in June, 1888, and placed under the Government of the Straits Settlements. In November of the same year a settlement was established at Flying Fish Cove by G. Clunies Ross of the Cocos-Keeling Islands. Houses were built, wells dug and small clearings made for the cultivation of coffee, coconut palms, bananas and several other plants of economic value, which were introduced at this time. A few years later the working control of the island passed to the Christmas Island Phosphate Company, who have been operating it ever since.

In July 1897 C. W. Andrews of the British Museum reached Christmas Island. He remained there for ten months, and during this period made most thorough collections of the flora and fauna. The reports on his material, by himself and others, were published in *A Monograph of Christmas Island* (British Museum, 1900). This work, which includes a history of the island, an account of its general structure and references to the papers on the earlier collections, is the foundation of our knowledge of it.

Several subsequent collections were made, but in all cases they were limited in range, and a number of important groups have not been covered since 1898. The later investigators include Dr. R. Hanitsch, who made a short visit in 1904, and Mr. M. W. F. Tweedie, who stayed for two months in 1932: both were working for the Raffles Museum. Andrews also returned for several months in 1908, to assist in the survey of the island, and a small collection of vertebrates was made in 1923 by two Dayaks from the Raffles Museum. The papers published on the material obtained from these later investigations are summarised in the Bulletin of the Raffles Museum (No. 8, 1933, pp. 51-151) in an introduction by F. N. Chasen to the reports on Mr. Tweedie's collections.

At the time of Andrews's first visit the island had been inhabited for less than nine years, and few changes had occurred in its fauna. Since then it has been in contact by boat with Singapore, Sumatra and Western Australia, in addition to Java and the Cocos-Keeling Islands. Andrews himself noted several new arrivals when he returned in 1908 (Proc. Zool. Soc., 1909, pp. 101-103) and there have no doubt been many more since that date. In a number of cases the collections recorded here were made with the object of establishing the data for assessing the extent of these changes.

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